

SENIOR 5 & SENIOR 6 TERM 2 HOLIDAY ASSIGNMENT

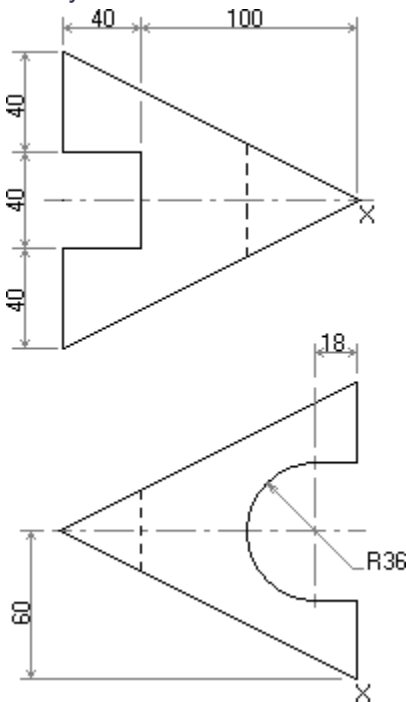
Instructions: Read the real-world technical problems presented below. Consult your workbook diagrams as referenced to find dimensions and geometric layouts to execute each drawing task accurately.

1. Isometric Projection

Item 1

A manufacturing firm is preparing a presentation for a new mechanical mounting component. To ensure clients clearly understand its three-dimensional form, a pictorial presentation is required.

Task: Use your drawing instruments to construct a full-size isometric view of the component, ensuring that the designated corner X serves as the lowest point in your construction. Show all hidden internal geometric details clearly.

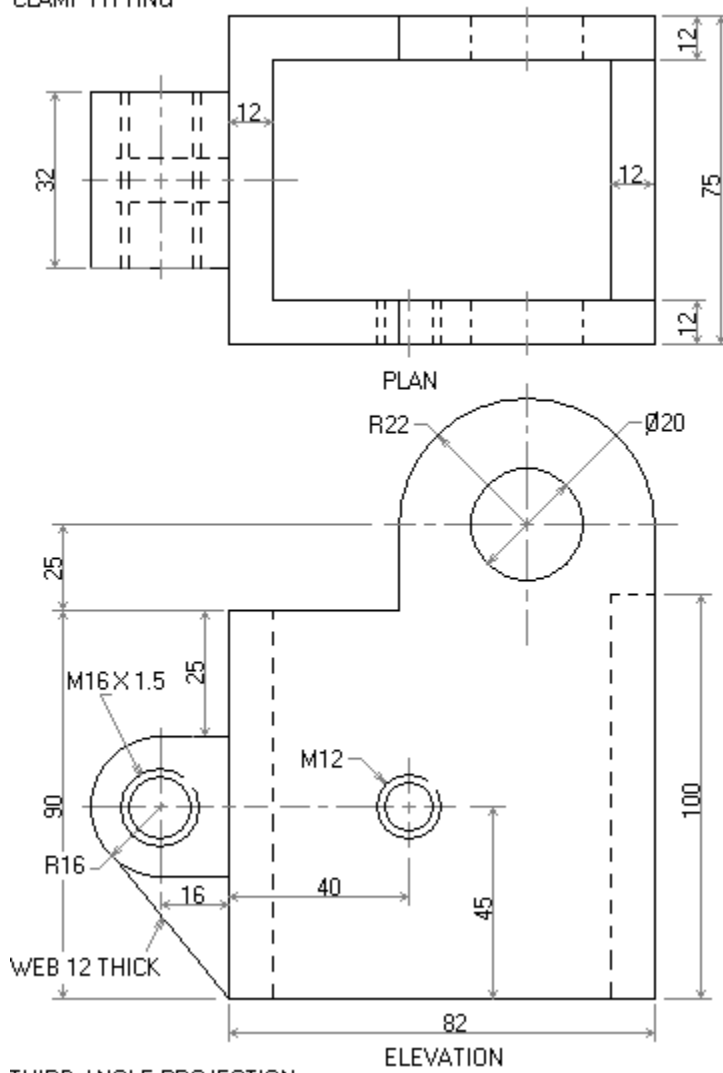


Item 2

An industrial technician needs to explain a clamp fitting component layout to an assembly line team who find it difficult to interpret standard two-view layouts.

Task: Convert the provided layout views into a full-scale isometric drawing. Position corner S as the absolute lowest point of your work. (Do not apply an isometric reduction scale).

CLAMP FITTING



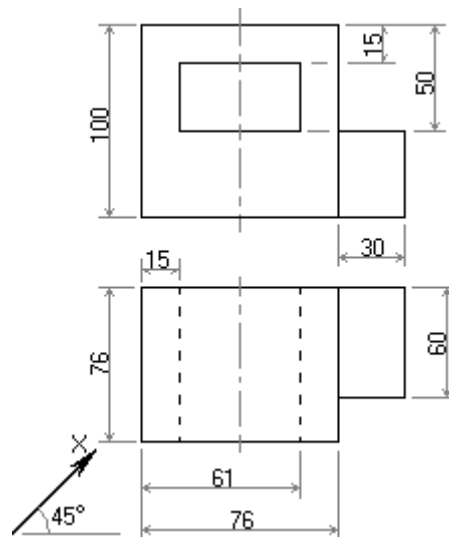
THIRD ANGLE PROJECTION

2. Orthographic Projection (First & Third Angle)

Item 3

A workshop requires a complete technical drawing breakdown of a specialized wooden shaped block to produce it with precise angled faces.

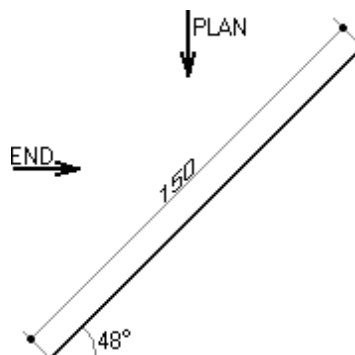
Task: Re-draw the provided views full size using first angle projection rules. Following that, project a clear auxiliary elevation view looking directly in the direction indicated by arrow X.



Item 4

An engineering draftsman needs a precise presentation layout of an angled structural component to confirm its clearance margins during installations.

Task: Draw the plan, front elevation, and the exact true shape of the component faces using third angle projection principles based on the standard parameters specified.

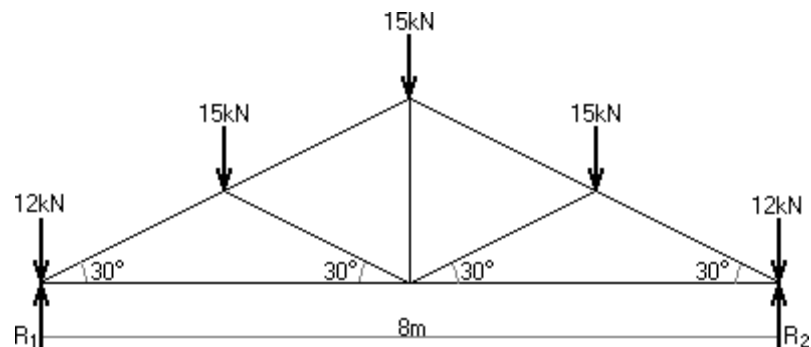


3. Concurrent and Non-Concurrent Co-Planar Forces

Item 5

A site logistics engineer needs to determine how a structural node handles a set of five co-planar external loads to prevent a dynamic failure under peak operational conditions.

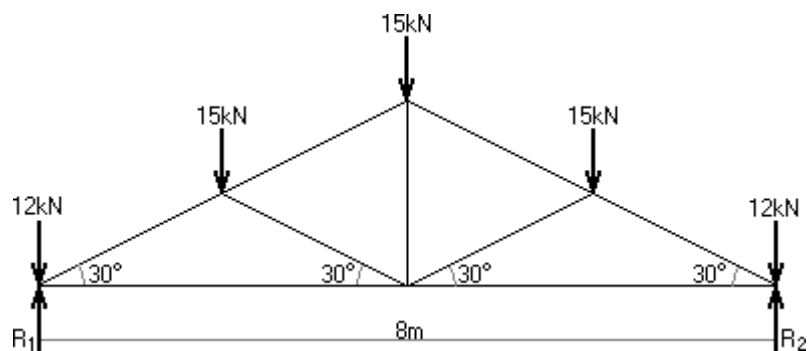
Task: Construct a precise space and vector diagram to determine the total resultant magnitude, direction, and specific point of action of the load configuration.



Item 6

An automated sorting tracking system tracks a dynamic rolling assembly point P along a specified sloped rail profile over a fixed horizontal length.

Task: Map the precise geometric locus path generated by point P as it rolls continuously without any slipping along the guide path profile.

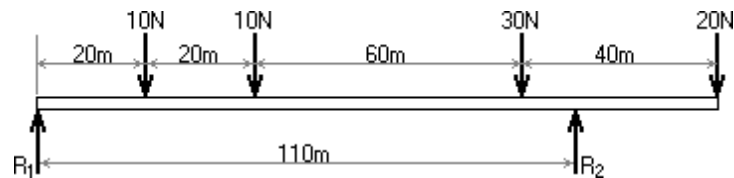


4. Forces in Beams and Frameworks

Item 7

A civil design office is verifying a warehouse platform support beam which spans a total length of 110 meters and bears multiple heavy point loads along its surface.

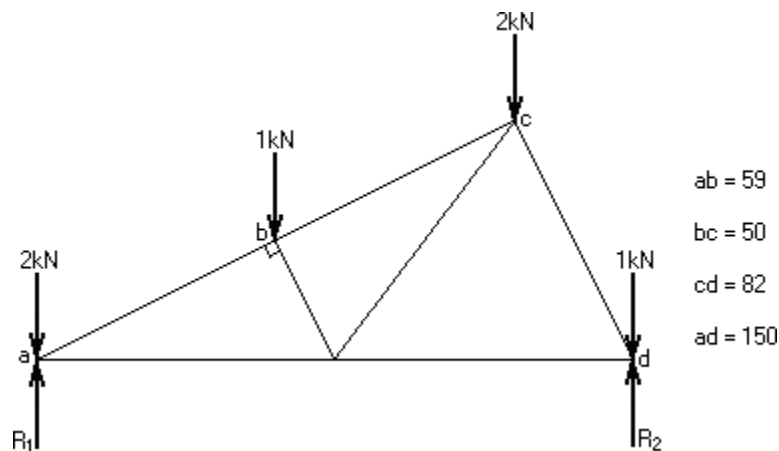
Task: Set up an appropriate space layout scale and determine the precise support reaction loads R_1 and R_2 using graphical vector and link polygon methods. Plot the corresponding Shear Force Diagram (SFD) and Bending Moment Diagram (BMD).



Item 8

An agricultural roof truss frame experiences severe localized vector loads at multiple connection nodes during stormy high-wind weather.

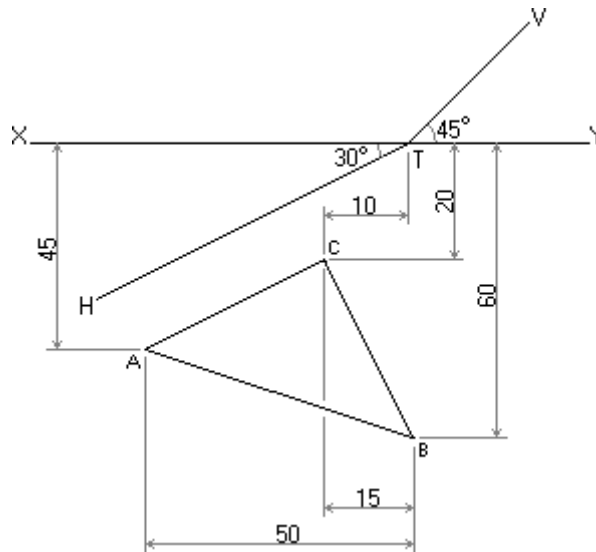
Task: Construct a comprehensive Bow's notation load vector diagram to establish the exact internal load magnitude and stress type (tension/compression) acting on structural members ab , bc , and cd .



5. Lines in Space & Oblique Planes

Item 9

A technical model maker is installing a structural triangular bracing fin ABC that sits flat against an oblique support face VTH inside a vehicle chassis frame.

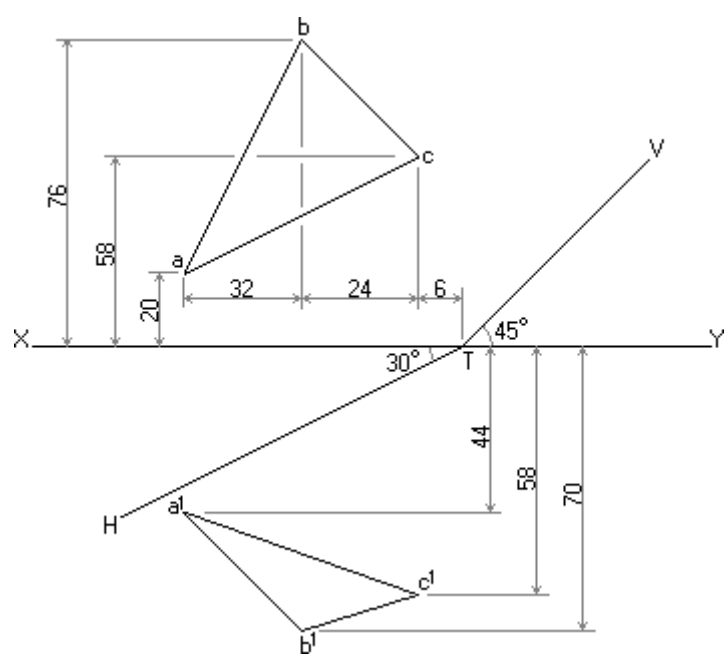


Task: Copy the layout plan and project the true elevation view along with the absolute true shape of triangle ABC relative to the plane traces.

Item 10

A designer must fit a triangular planar plate against an inclined structural surface layout VTH and requires the exact angle parameter for cutting raw steel sheets.

Task: Project the primary plan and elevation views on the oblique layout plane, determine its complete true shape, and measure the exact true inclination angle of the oblique face relative to the vertical reference plane.

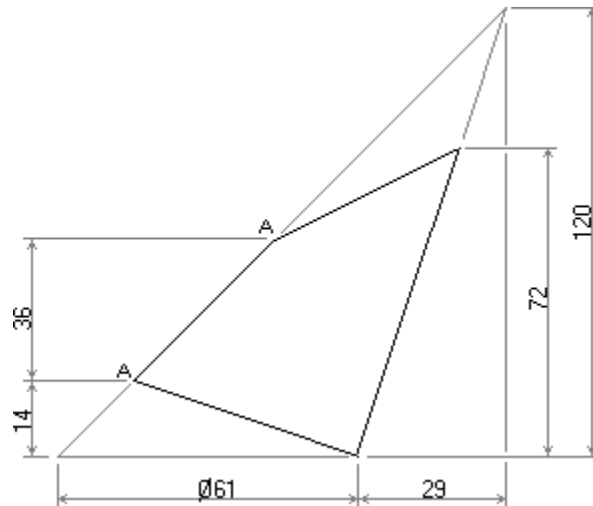


6. Development by Triangulation

Item 11

A processing factory requires a custom transition piece fabricated from a sheet metal plate to join an offset square intake hopper down to an oblique conical trunk section.

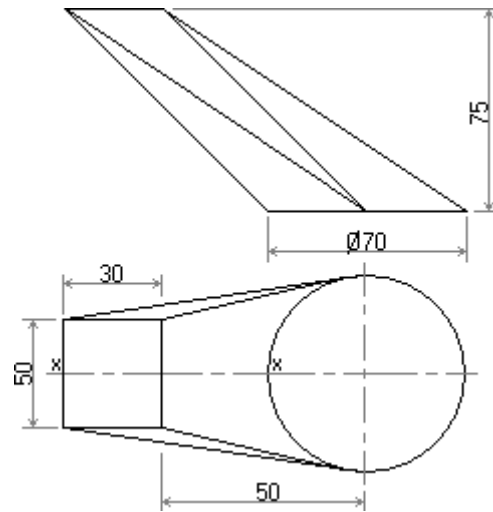
Task: Develop the flat surface layout template for the truncated oblique piece using precise triangulation methods, treating line A-A as your splitting line seam.



Item 12

An air conditioning ventilation system requires a transitional sheet metal duct connection to match an irregular sloped duct line to a uniform main duct system.

Task: Draw the two provided orthographic views full size and construct a full surface flat layout development pattern of the duct piece with x-x chosen as the layout joint seam.

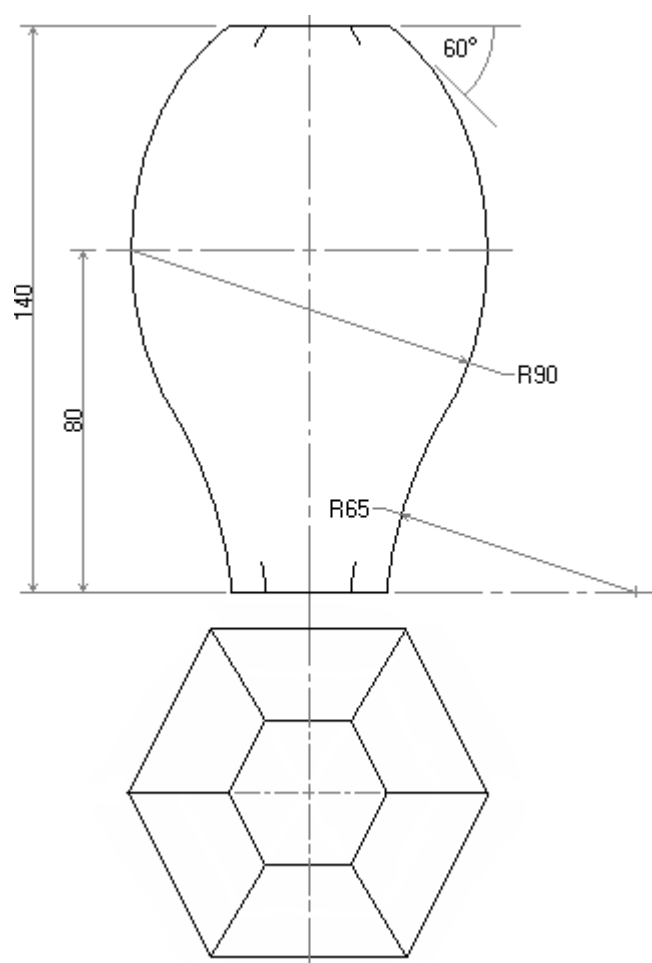


7. Panel Development

Item 13

A design team is creating a modular architectural dome element fabricated from six individual pre-shaped matching structural panels that assemble into a regular hexagon form.

Task: Re-draw the incomplete elevation view and complete the missing geometric boundaries. Create a full-size surface layout development template for a single panel.

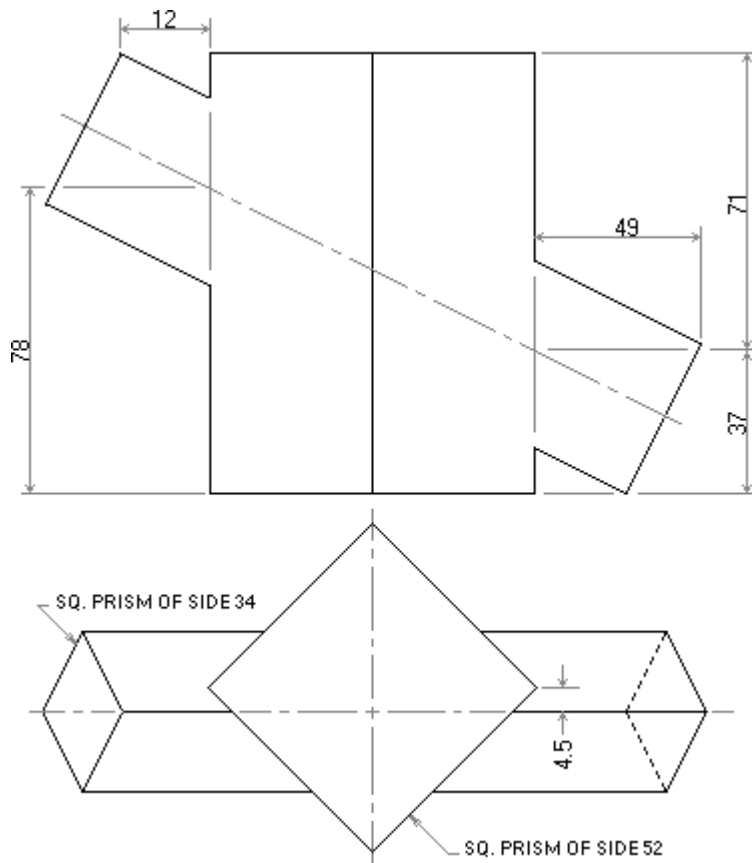


8. Intersection of Solids

Item 15

An industrial pipe network requires two dissimilar square prism conduits to bypass each other while intersecting at a specific structural junction.

Task: Draw the given orthographic views accurately and use intersection line projection techniques to find and complete the lines of interpenetration between the two solids.



Item 16

A component in a dust extraction filter unit features a right cylinder branch pipe intersecting a main right cone collection housing.

Task: Trace the provided layout views and accurately project the geometric curve of intersection. Following that, construct a full development of the cone to show the true shape of the cutout penetration hole.

